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ABSTRACT

This study investigated the effects of high and low need achievement, individual vs. group test adminstration, and potential dropout and nonpotential dropout on the Manual Dexterity Aptitude of the General Aptitude Test Battery. Following the administration of the Thematic Apperception Test (TAT), 120 high school males were assigned to one of eight treatments. Although there were significant differences by need achievement level, there was no difference by subject group. The interactions of the three independent variables revealed that poor performance resulted from either having low need achievement or from being tested individually. This study did not demonstrate what conditions needed to be present to produce maximum performance; it demonstrated what conditions, when absent, produced significantly lower test scores. (Author/BJG)

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The Relationship between Need Achievement and Conditions of Testing on a Manual Dexterity Test *

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The extensive literature on need Achievement (n Ach) has clearly demonstrated that this concept is related to performance on many tasks and under many conditions. A common finding is the relationship between n Ach and grades in school, achievement test results, and other academic criteria (Klinger, 1966; Klinger & McNally, 1969). The construct validity of achievement motivation has been well established in these areas. Although it is logical to extend this construct validity to standardized performance testing as well, little or no research has been done in this area. It has not been demonstrated, then whether or not n Ach is related to performance test scores. From the pure research point-of-view this study attempted to extend the construct validity of need Achievement into the area of performance testing; from a practical point-of-view, the study attempted to determine if achievement motivation should be considered in the scoring and the interpretation of test results.

Many of the dexterity tests commonly used for industrial selection were originally designed and normed as individually administered tests (e.g. Bennett Hand-Tool Dexterity Test and Crawford Small Parts Dexterity Test). In spite of this, many of these test administration manuals state that group administration is permissible, if not desirable for reasons of economy. The results of investigations of coaction (e.g. Zajonc, 1965; Cottrell et al., 1968), which closely resembles the group testing situation, imply that persons tested in a group will have higher mean scores than persons tested individually. A sound demonstration of the differences between the scores of individual and group administered tests would reinforce the need for more consistent practices in using personnel selection tests.

For male high school dropouts the most realistic chances for successful employment are in the semi-skilled occupations, such as assembly line workers, bus and truck drivers, and the construction industry. Selection for these jobs typically involves the use of standardized dexterity tests. Although many of these tests are administered by the employer's personnel office, the dropout is frequently tested by the State Employment Service. This is especially true if he is involved in one of the numerous programs funded under the Manpower Training and Development Act of 1964 and its amendments.

The purpose of this study was to explore some of the variables related to performance testing for two groups of male high school students - potential dropouts and nonpotential dropouts (i.e. "regular" students). The effects of n Ach and individual vs. group test administration were related to performance on the Manual Dexterity Aptitude (Aptitude M) of the General Aptitude Test Battery. The relationship between test anxiety and Aptitude M was also investigated.

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Method

The subjects consisted of 60 potential dropouts from 14 high schools who were participating in an intensive two-week work evaluation program and 60 "regular" students from three high schools. All 120 students were white and all were from rural areas of northern Wisconsin. In the initial testing session all 120 subjects were administered six TAT pictures having "high pull" on n Ach (Ricciuti & Sadacca, 1955), a modified

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* This research was incorporated in a doctoral dissertation completed at The George Washington University. The author thanks Ralph K. White for his advice.

version of the Test Anxiety Scale (TAS) (Sarason, 1958), and a brief biographical questionnaire. Both groups were divided at the medians of their respective n Ach distributions, resulting in four subgroups. Each of these four groups was randomly assigned to group or individual test administration conditions. The resulting 2x2x2 analysis of covariance design had 15 students in each of eight treatment conditions (i.e. potential dropout - "regular" students, high - low n Ach, and individual - group test administration). TAS was the covariant and Aptitude M scores were the dependent variable.

Results

When the analysis of covariance revealed a pooled within-class correlation of .019 between Aptitude M and TAS, it was decided to abondon the use of TAS as a covariant and to use an analysis of variance design (Table 1). Two t tests for independent means and the analysis of variance were used to test eight hypotheses; the

Table 1

Analysis of Variance

Source	df	M.S.	F
Subjects (A)	1	210.676	.963
n Ach Level (B)	1	1274.875	5.828*
Administration (C)	1	2296.875	10.500**
A x B	1	957.675	4.378*
A x C	1	371.008	1.696
B x C	1	2774.409	12.683**
A x B x C	1	14.008	.064

*$p<.05$ **$p<.01$

statistically significant results were as follows:

1. The mean (M = 5.283) n Ach score of the "regular" students was significantly higher ($t = 2.652$; $p<.01$) than the mean (M = 2.967) n Ach score of the potential dropouts.
2. As shown by main effect B, students above the median on their respective n Ach distribution had significantly higher Aptitude M scores (M = 82.233) than did students below the median on n Ach (M = 75.717).
3. Main effect C showed that students tested in a group had significantly higher Aptitude M scores (M = 83.600) than students tested individually (M = 74.600).
4. There was a significant AxB interaction between the type of student and the n Ach level. These groups were ranked as follows: (a) potential dropout - high n Ach (M = 83.733), (b) "regular" student - high n Ach (M = 80.733), (c) "regular" student - low n Ach (M = 79.867), and (d) potential dropout - low n Ach (M = 71.567). A Newman-Keuls test revealed that the only significant differences ($p<.01$) were between the potential dropout - low n Ach group and the other three treatment combinations.
5. There was a significant BxC interaction between the level of n Ach and the type of test administration. These groups were ranked as follows: (a) low n Ach - group (M = 84.900), (b) high n Ach - individual (M = 82.667), (c) high n Ach - group (M = 81.800), and (d) low n Ach - individual (M = 66.533). A Newman-Keuls test revealed that the only significant differences ($p<.01$) were between the low n Ach - individual combination and the other treatments.

Discussion

The significant difference between high and low n Ach subjects extended the construct validity of n Ach into the area of performance testing. Although this finding was

demonstrated only for GATB Aptitude M, it is possible that this result could be generalized to other standardized dexterity tests. The lack of a significant difference between potential dropouts and "regular" students on Aptitude M scores confirmed earlier GATB research which found no significant differences between dropouts and students on Aptitude M (U.S. Department of Labor, 1970). Therefore, no special procedures or considerations are required for the group testing of potential dropouts on Aptitude M of the GATB. Group test administration produced significantly high Aptitude M scores than did individual test administration. Unfortunately, the random relationship between the TAS covariant and the dependent variable did not permit control for test anxiety. While group test administration resulted in higher test scores, the relationship between type of test administration and test anxiety is open to question.

The interactions between the level of n Ach, type of student, and testing condition were intended to indicate which combination of treatments would result in mazimum performance. Instead the interactions indicated that the absence of either high n Ach or group administration in each interaction resulted in a significantly lower mean score. Either being a "regular" student or being above the median on n Ach was capable of producing test scores which were significantly higher than the potential dropout - low n Ach treatment combination, which contained neither of the necessary and sufficient conditions. Likewise, the significance of the n Ach - test condition interaction depended upon the difference between three treatments(high n Ach - group, low n Ach - group, and high n Ach - individual) and the fourth, containing neither high n Ach nor group administration. When the interaction of the three independent variables was considered prior to data analysis, it was expected that the "regular" students having high n Ach and tested in a group would have a mean Aptitude M score that was significantly higher than the other combinations of variables. Based on the results, something quite different was concluded: Potential dropouts having low n Ach and tested individually had significantly lower test scores than subjects not classified under all of these three conditions. This study did not demonstrate what conditions needed to be present to produce maximum performance; it demonstrated what conditions, when all of them are absent, produced significantly lower test scores.

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